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National greenhouse gas inventory data for the period 1990–2016

Report by the secretariat

Summary

All 43 Parties included in Annex I to the Convention (Annex I Parties) submitted their greenhouse gas (GHG) inventory common reporting format tables and national inventory reports in 2018. By the deadline of 15 April 2018, common reporting format tables and national inventory reports from 41 Parties had been received. Over the period 1990–2016 total aggregate GHG emissions without emissions and removals from land use, land-use change and forestry (LULUCF) for all Annex I Parties decreased by 13.0 per cent, while total GHG emissions and removals with LULUCF decreased by 18.5 per cent. For Annex I Parties with economies in transition, GHG emissions without and with LULUCF decreased by 37.6 and 49.6 per cent, respectively. For Annex I Parties that do not have economies in transition, GHG emissions without and with LULUCF decreased by 1.3 and 2.5 per cent, respectively. The information in this document is based on information in the national GHG inventory submissions of Annex I Parties received as at 31 August 2018. At the time of the publication of this document, the annual review process for GHG inventories from Annex I Parties was ongoing; therefore, the data included in this document may not reflect the latest information provided by Parties. The latest GHG inventory data are available on the UNFCCC website.

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I. Introduction

A. Mandate

1. The Conference of the Parties (COP), by decision 24/CP.19, requested Parties included in Annex I to the Convention (Annex I Parties) to submit national inventory data on greenhouse gas (GHG) emissions by sources and removals by sinks by 15 April of each year. By decision 13/CP.20, paragraphs 8 and 10, the COP requested the secretariat to compile and summarize information on GHG inventory data submitted by Annex I Parties, inter alia, for consideration by the COP and the subsidiary bodies.

B. Scope

2. This document shows the status of reporting of GHG inventories by Annex I Parties in 2018 (chapter II) and provides a summary of the latest available data on GHG emissions and removals for the period 1990–2016 (chapter III). Data are provided for carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), as well as for fluorinated gases (F-gases),[1] and, where Parties have elected to report them, indirect CO_2 emissions from the atmospheric oxidation of CH_4, carbon monoxide and non-methane volatile organic compounds. Data are provided on total[2] aggregate[3] GHG emissions, both without and with net GHG emissions and removals from land use, land-use change and forestry (LULUCF).

3. The information provided in this document is based on the national GHG inventory submissions received from all 43 Annex I Parties (see table 1) as at 31 August 2018.

4. At the time of the publication of this document, the annual review process for GHG inventories from Annex I Parties was ongoing; therefore, the data presented here may not reflect the latest information provided by Parties. The latest GHG inventory data submitted by Parties are available on the UNFCCC website.[4]

C. Possible action by the Subsidiary Body for Implementation

5. The Subsidiary Body for Implementation may wish to take note of the information contained in this document and to seek further guidance from the COP, as appropriate.

II. Status of reporting

A. Timeliness and completeness of submissions

6. According to the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories" (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines),[5] Annex I Parties are required to submit annually a national inventory report (NIR) and common reporting format (CRF) tables containing data from the

[1] F-gases comprise hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), an unspecified mix of HFCs and PFCs (MIX) and nitrogen trifluoride (NF_3) taken together.

[2] The term "total" implies that emissions from the sectors of the common reporting format are summed; the inclusion of emissions from land use, land-use change and forestry in the sum is indicated separately; unless stated otherwise, totals do not include indirect CO_2 emissions.

[3] The term "aggregate" implies that GHG emissions and removals are calculated as a weighted sum of CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, MIX and NF_3 using the global warming potential values agreed under the Convention.

[4] http://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018.

[5] Decision 24/CP.19, annex I.

base year up to two years prior to the year of submission. In 2018 all 43 Annex I Parties provided GHG data for all years from 1990[6] to 2016.

7. By 15 April 2018, CRF tables and NIRs had been received from 41 Parties. Within six weeks of that date, all 43 Parties had submitted their CRF tables and NIRs. After the initial submissions, 11 Parties submitted revised versions of their CRF tables and 9 Parties resubmitted their NIRs. The dates of the initial submissions of the CRF tables are shown in table 1.

Table 1
Greenhouse gas inventory submissions from Annex I Parties in 2018

Party	*CRF tables submission date*[a]	*Party*	*CRF tables submission date*[a]
Australia	13 April 2018	Liechtenstein	12 April 2018
Austria	12 April 2018	Lithuania	13 April 2018
Belarus	13 April 2018	Luxembourg	5 April 2018
Belgium	13 April 2018	Malta	12 April 2018
Bulgaria	14 April 2018	Monaco	14 April 2018
Canada	13 April 2018	Netherlands	13 April 2018
Croatia	12 April 2018	New Zealand	12 April 2018
Cyprus	13 April 2018	Norway	13 April 2018
Czechia	12 April 2018	Poland	10 April 2018
Denmark	13 April 2018	Portugal	11 April 2018
Estonia	14 April 2018	Romania	13 April 2018
European Union	14 April 2018	Russian Federation	14 April 2018
Finland	6 April 2018	Slovakia	10 April 2018
France	13 April 2018	Slovenia	13 April 2018
Germany	5 April 2018	Spain	2 April 2018
Greece	15 April 2018	Sweden	13 April 2018
Hungary	13 April 2018	Switzerland	13 April 2018
Iceland	12 April 2018	Turkey	14 April 2018
Ireland	13 April 2018	Ukraine	*23 May 2018*
Italy	13 April 2018	United Kingdom	12 April 2018
Japan	*24 April 2018*	United States	12 April 2018
Latvia	13 April 2018		

Abbreviation: CRF = common reporting format.

[a] Dates after 15 April 2018 are shown in italics. The dates of submission of the national inventory reports may be different.

B. Recalculations

8. According to the UNFCCC Annex I inventory reporting guidelines, Parties should, where necessary, conduct recalculations in order to improve the quality of their emission estimates and ensure the consistency of the time series.

9. In 2018 all 43 Annex I Parties reported recalculations that had an impact on their estimated GHG emissions for 1990 (see table 2). The recalculations resulted from changes in

[6] Unless otherwise specified, for certain Parties base-year data are used instead of 1990 data. The Parties that may use a base year other than 1990, as stipulated in decisions 9/CP.2 and 11/CP.4, are Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

activity data, emission factors and methodologies. For total aggregate GHG emissions without LULUCF, the change was less than 1 per cent for 33 Parties and more than 3 per cent for 1 Party. For total aggregate GHG emissions with LULUCF, the change was less than 1 per cent for 27 Parties and more than 3 per cent for 7 Parties.

Table 2
Inventory recalculations by Annex I Parties in 2018

Party	*Impact on GHG emissions for 1990 without LULUCF (%)*	*Impact on GHG emissions for 1990 with LULUCF (%)*
Australia	0.06	–0.44
Austria	–0.15	0.06
Belarus	1.72	2.04
Belgium	0.25	0.50
Bulgaria	0.32	0.52
Canada	–1.28	4.65
Croatia	2.38	2.92
Cyprus	–0.54	–3.58
Czechia	0.84	0.83
Denmark	0.15	–0.01
Estonia	–0.01	0.48
European Union	0.06	–0.46
Finland	0.03	–2.27
France	–0.13	–0.02
Germany	0.06	0.06
Greece	0.02	0.08
Hungary	–0.06	–0.01
Iceland	2.20	0.27
Ireland	–1.09	–0.02
Italy	–0.30	–0.26
Japan	–0.12	–0.05
Latvia	1.10	–9.34
Liechtenstein	0.03	0.89
Lithuania	0.14	–3.33
Luxembourg	0.44	0.43
Malta	–11.75	–11.74
Monaco	0.39	0.39
Netherlands	–0.07	–0.07
New Zealand	1.92	5.29
Norway	–0.06	0.13
Poland	–0.09	0.06
Portugal	0.71	–0.43
Romania	0.00	0.00
Russian Federation	–0.89	–0.94
Slovakia	–0.65	–1.58
Slovenia	0.12	1.85
Spain	–0.06	–5.47
Sweden	–0.17	1.88
Switzerland	–0.30	–1.15

Party	*Impact on GHG emissions for 1990 without LULUCF (%)*	*Impact on GHG emissions for 1990 with LULUCF (%)*
Turkey	–1.52	–1.07
Ukraine	–1.58	–2.34
United Kingdom	0.00	0.00
United States	–0.12	–0.13

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

10. Table 3 presents a comparison of the estimates of total aggregate GHG emissions in 1990 contained in Annex I Parties' 2017 and 2018 GHG inventory submissions.

Table 3

Comparison of estimates reported in 2017 and 2018 of total aggregate greenhouse gas emissions of Annex I Parties in 1990

	Estimate reported in 2017	*Estimate reported in 2018*	*Explanation of the difference between the estimates reported in 2017 and 2018*
Total aggregate GHG emissions without LULUCF (thousands of Tg CO_2 eq)			
All Annex I Parties	19.75	19.69	Aggregate impact of inventory recalculations by individual Annex I Parties
Annex I EIT Parties	6.40	6.36	Inventory recalculations, for example by Belarus, Croatia and Ukraine
Annex I non-EIT Parties	13.35	13.34	Inventory recalculations, for example by Canada, Iceland and Malta
Total aggregate GHG emissions with LULUCF (thousands of Tg CO_2 eq)			
All Annex I Parties	18.74	18.68	Aggregate impact of inventory recalculations by individual Annex I Parties
Annex I EIT Parties	6.40	6.34	Inventory recalculations, for example by Belarus, Latvia and Ukraine
Annex I non-EIT Parties	12.34	12.33	Inventory recalculations, for example by Malta, New Zealand and Spain

Abbreviations: EIT = economy in transition, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

III. Overview of emission trends and sources in Annex I Parties

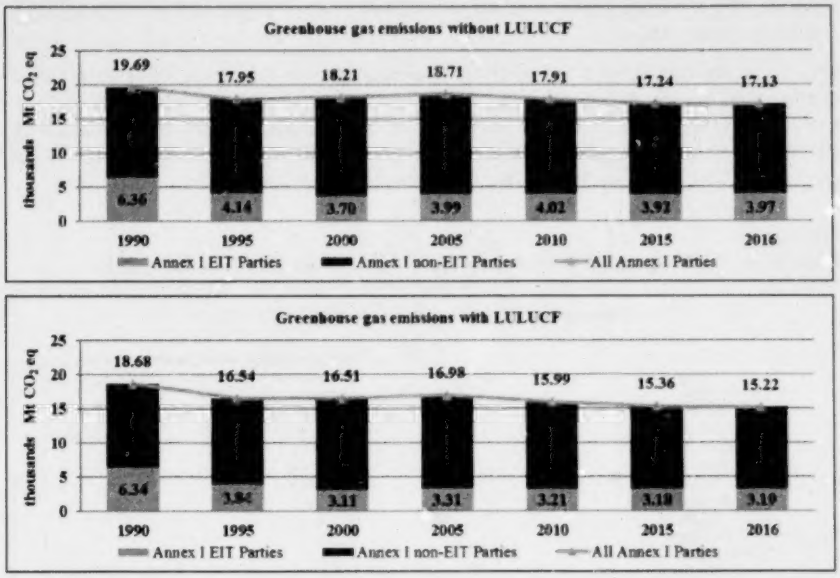
A. Total aggregate greenhouse gas emissions

11. From 1990 to 2016, total aggregate GHG emissions without emissions and removals from LULUCF for all Annex I Parties decreased by 13.0 per cent, from 19,694.24 to 17,127.42 Mt CO_2 eq. During the same period, total aggregate GHG emissions with LULUCF decreased by 18.5 per cent, from 18,675.37 to 15,219.27 Mt CO_2 eq. From 2000 to 2016, GHG emissions without and with LULUCF decreased by 5.9 and 7.8 per cent, respectively. Between 2015 and 2016, GHG emissions decreased by 0.6 per cent without LULUCF and by 0.9 per cent with LULUCF.

12. Figures 1 and 2 show the trends in total aggregate GHG emissions from 1990 to 2016 for all Annex I Parties taken together, for Annex I Parties with economies in transition (Annex I EIT Parties) and for Annex I Parties that do not have economies in transition (Annex I non-EIT Parties).

Figure 1

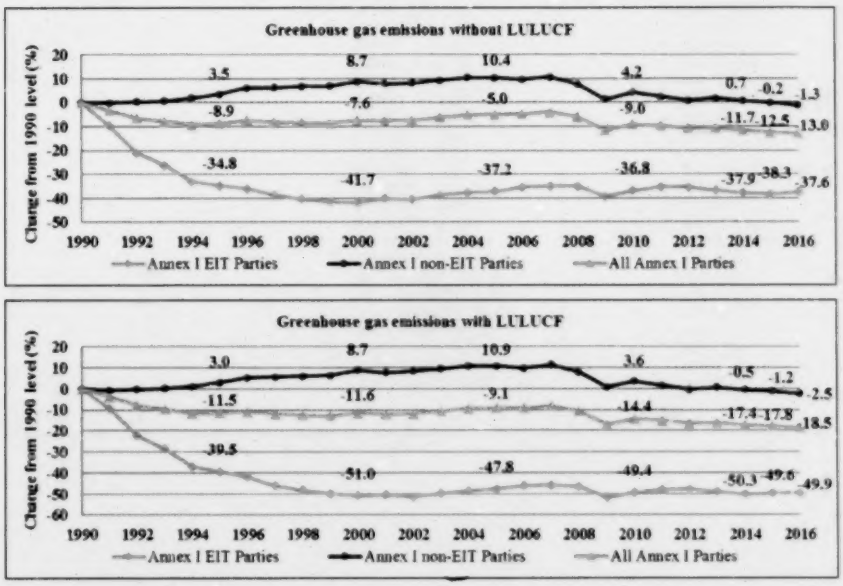
Greenhouse gas emissions of Annex I Parties, 1990, 1995, 2000, 2005, 2010, 2015 and 2016



Abbreviations: EIT = economy in transition, LULUCF = land use, land-use change and forestry.

Figure 2

Changes in greenhouse gas emissions of Annex I Parties, 1990–2016



Abbreviations: EIT = economy in transition, LULUCF = land use, land-use change and forestry.

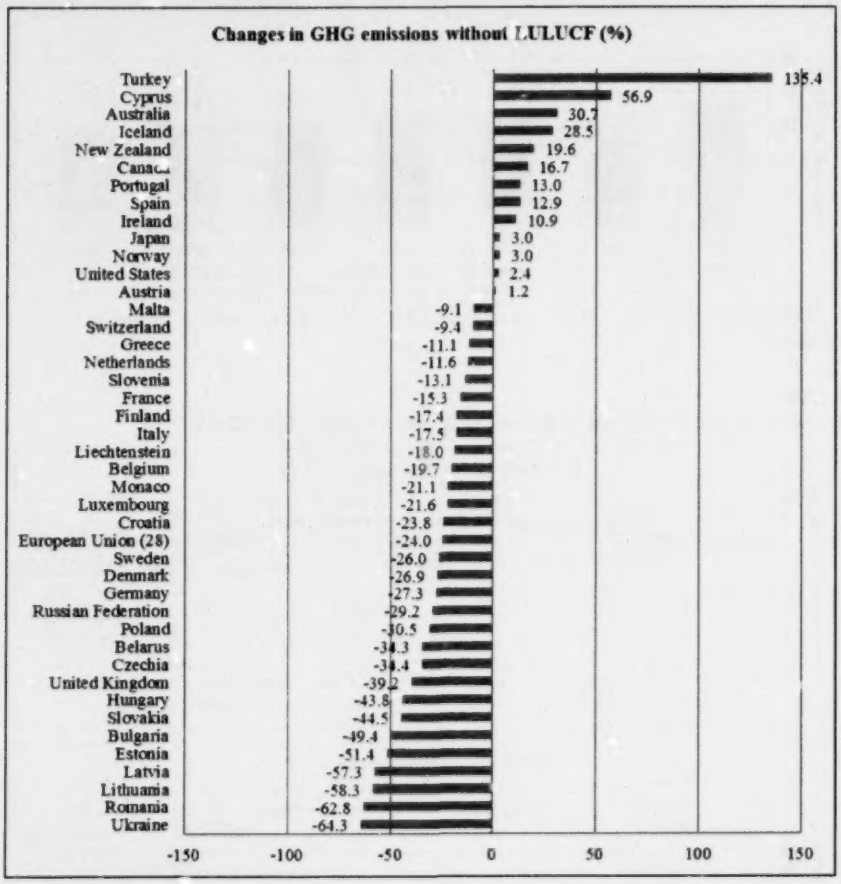
13. For Annex I EIT Parties, GHG emissions from 1990 to 2016 decreased by 37.6 per cent without LULUCF and by 49.6 per cent with LULUCF. From 2000 to 2016, GHG emissions without and with LULUCF increased by 7.1 and 2.8 per cent, respectively. Between 2015 and 2016, GHG emissions without and with LULUCF increased by 1.1 and 0.6 per cent, respectively.

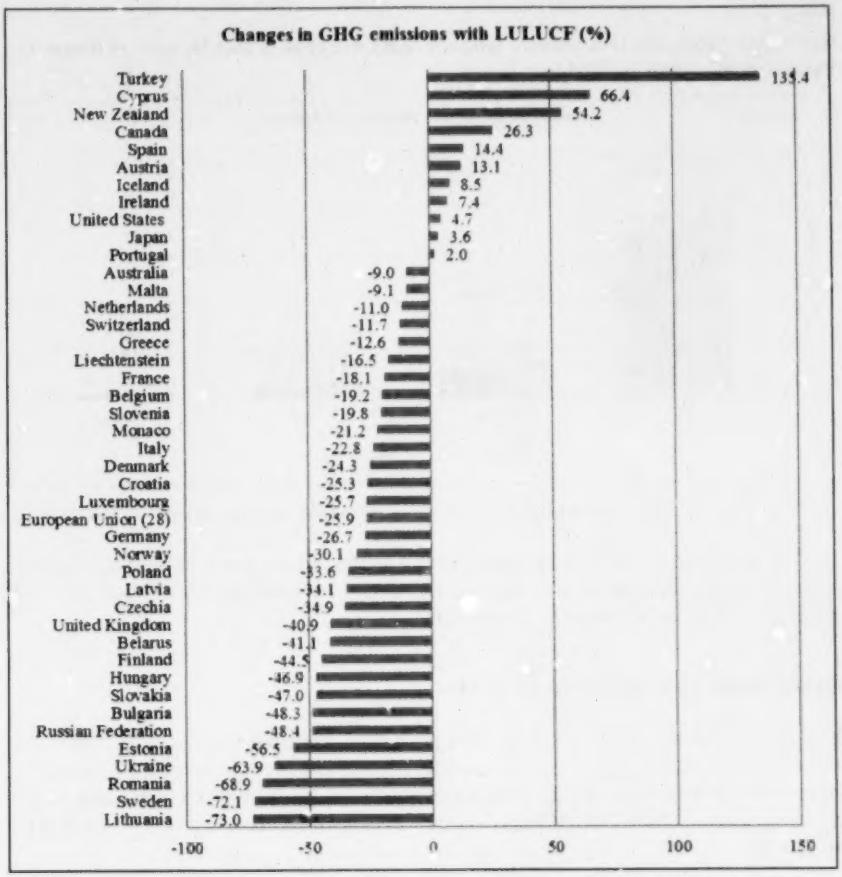
14. For Annex I non-EIT Parties, GHG emissions from 1990 to 2016 decreased by 1.3 per cent without LULUCF and by 2.5 per cent with LULUCF. From 2000 to 2016, GHG emissions without and with LULUCF decreased by 9.2 and 10.3 per cent, respectively. Between 2015 and 2016, GHG emissions showed a decrease of 1.1 per cent without LULUCF and 1.3 per cent with LULUCF.

15. The changes in total aggregate GHG emissions over the period 1990–2016 varied considerably among Parties (see figure 3). The largest decrease in emissions without LULUCF was in Ukraine (by 64.3 per cent), while the largest decrease in emissions with LULUCF was in Lithuania (by 73.0 per cent). The greatest increases in emissions without and with LULUCF were in Turkey (by 135.4 per cent in both cases).

Figure 3

Changes in total aggregate emissions of individual Annex I Parties, 1990–2016





Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

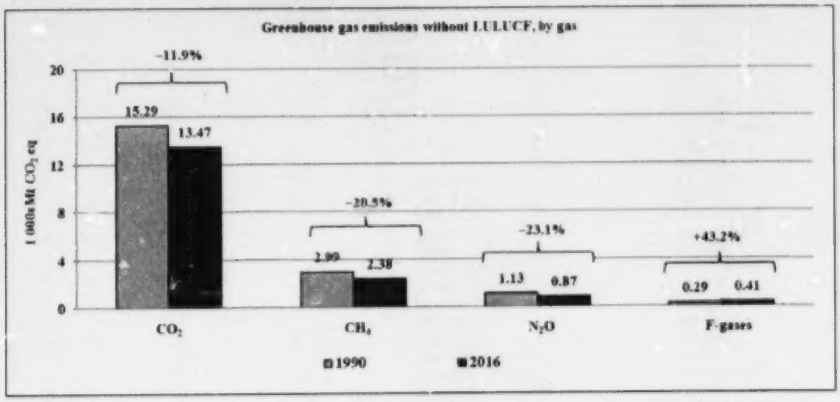
B. Greenhouse gas emissions by gas

16. Throughout the period 1990–2016 CO_2 accounted for the largest share of total emissions, contributing 77.6 per cent in 1990 and 78.7 per cent in 2016. CH_4 was the second-highest contributor to total GHG emissions (15.2 per cent in 1990 and 13.9 per cent in 2016), followed by N_2O (5.7 per cent in 1990 and 5.1 per cent in 2016). Emissions of F-gases contributed 1.5 per cent in 1990 and 2.4 per cent in 2016 to the total GHG emissions.

17. Figure 4 shows the contribution of each GHG to the total emissions without LULUCF for 1990 and 2016 and the changes in the total emissions of each GHG over the period 1990–2016. Emissions of CO_2, CH_4 and N_2O decreased, while emissions of F-gases increased by 43.2 per cent.

Figure 4

Greenhouse gas emissions without land use, land-use change and forestry of Annex I Parties by gas, 1990 and 2016



Abbreviations: F-gases = fluorinated gases, LULUCF = land use, land-use change and forestry.

18. Between 2015 and 2016, emissions of CO_2 and N_2O decreased by 0.9 and 0.7 per cent, respectively. During the same period emissions of CH_4 increased by 0.3 per cent and emissions of F-gases increased by 1.9 per cent.

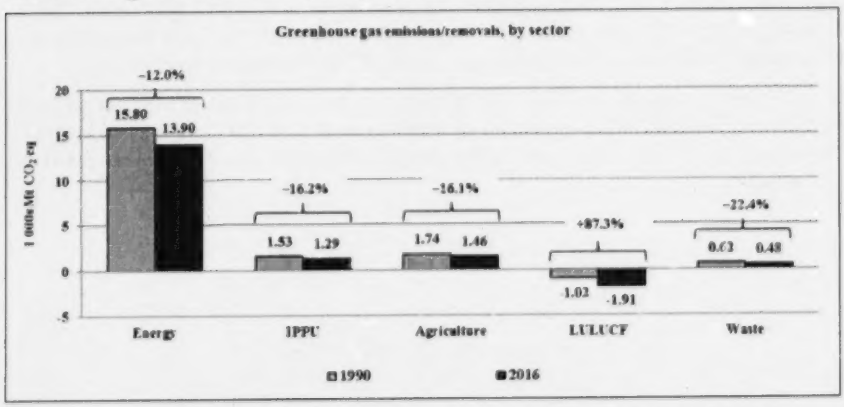
C. Greenhouse gas emissions by sector

19. From 1990 to 2016, emissions from all sectors decreased (see figure 5). The waste sector experienced the largest relative decrease in emissions (by 22.4 per cent), followed by the industrial processes and product use, agriculture and energy sectors. Over the same period net GHG removals from LULUCF increased by 87.3 per cent, from –1,018.88 to –1,908.16 Mt CO_2 eq.

20. Between 2015 and 2016, emissions from the energy, agriculture and waste sectors decreased by 0.8, 0.02 and 0.8 per cent, respectively, while emissions from the industrial processes and product use sector increased by 0.1 per cent. Net GHG removals from LULUCF increased by 1.7 per cent.

Figure 5

Greenhouse gas emissions and removals of Annex I Parties by sector, 1990 and 2016

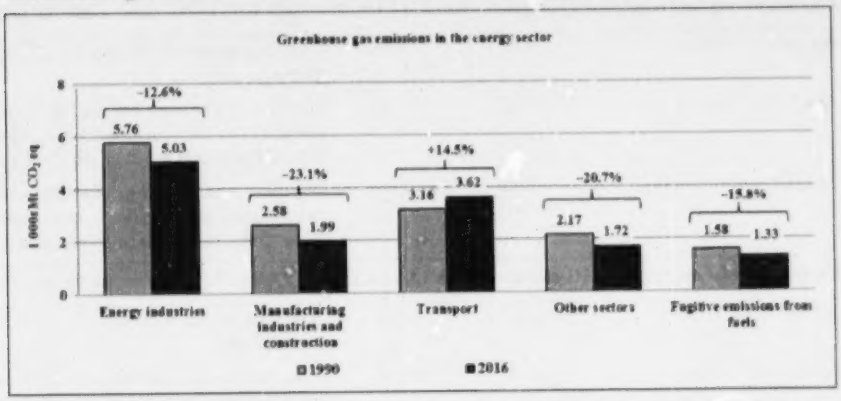


Note: The sector other is not included in this figure because its contribution to total greenhouse gas emissions was very small. The emissions from that sector decreased by 0.2 per cent between 1990 and 2016.

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.

21. Within the energy sector, GHG emissions from 1990 to 2016 decreased in all subsectors except transport, where emissions increased by 14.5 per cent (see figure 6). The largest relative emission reduction occurred in manufacturing industries and construction (where emissions decreased by 23.1 per cent).

Figure 6
Greenhouse gas emissions of Annex I Parties in the energy sector, 1990 and 2016

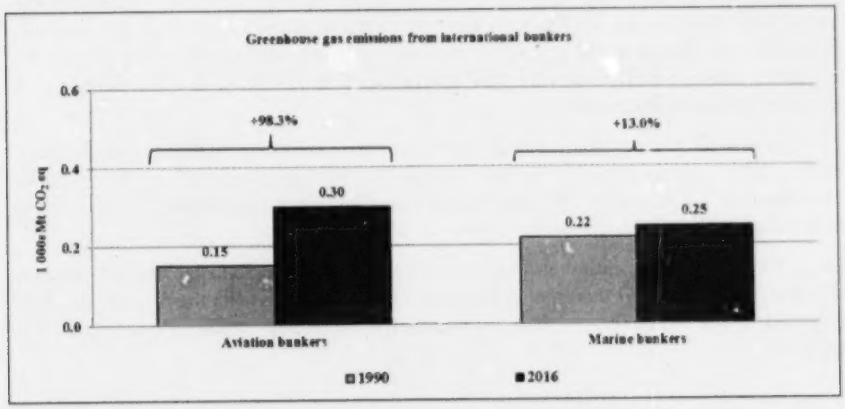


Note: The CO_2 transport and storage sector is not included in this figure because its contribution to the total greenhouse gas emissions was very small.

22. Between 2015 and 2016, emissions from energy industries, manufacturing industries and construction and other sectors decreased, whereas emissions from transport and fugitive emissions increased.

23. Over the period 1990–2016 emissions from international bunkers increased by 98.3 per cent for aviation and by 13.0 per cent for navigation (see figure 7).

Figure 7
Greenhouse gas emissions from international bunker fuels for Annex I Parties, 1990 and 2016



24. Between 2015 and 2016, emissions from international bunkers increased by 3.8 per cent for aviation and decreased by 0.1 per cent for navigation.

25. A comparison of the percentage changes in total aggregate GHG emissions from 1990 to the latest available year reported in Annex I Parties' 2017 and 2018 inventory submissions is presented in table 4, with explanations for the differences in the estimates.

Table 4

Comparison of the changes in the total aggregate greenhouse gas emissions of Annex I Parties reported in 2017 and 2018

	Estimate reported in 2017	*Estimate reported in 2018*	*Explanation of the difference between the estimates reported in 2017 and 2018*
Change in total aggregate GHG emissions without LULUCF from 1990 to the latest available year (%)			
All Annex I Parties	–11.91	–13.03	Combined impact of changes for individual Annex I Parties
Annex I EIT Parties	–37.82	–37.62	Increases in emissions between 2015 and 2016 and inventory recalculations, for example for Poland, Russian Federation and Ukraine
Annex I non-EIT Parties	0.51	–1.31	Decreases in emissions between 2015 and 2016 and inventory recalculations, for example for Japan, United Kingdom and United States
Change in total aggregate GHG emissions with LULUCF from 1990 to the latest available year (%)			
All Annex I Parties	–17.17	–18.51	Combined impact of changes for individual Annex I Parties
Annex I EIT Parties	–48.85	–49.63	Decreases in emissions between 2015 and 2016 and inventory recalculations, for example for Estonia, Latvia and Ukraine
Annex I non-EIT Parties	–0.75	–2.50	Decreases in emissions between 2015 and 2016 and inventory recalculations, for example for Japan, Sweden and United Kingdom

Abbreviations: EIT = economy in transition, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

D. Emission data for individual Annex I Parties

26. Tables 5–17 show detailed GHG data for individual Annex I Parties. Total aggregate GHG emissions without and with emissions and removals from LULUCF are provided in tables 5 and 6; emissions of CO_2, CH_4 and N_2O (without and with emissions and removals from LULUCF) are provided in tables 7–12; emissions of F-gases are provided in table 13; emissions and removals from LULUCF are provided in tables 14–16; and indirect CO_2 emissions are provided in table 17.

27. Blank cells in the tables denote that either data were not available or notation keys, such as "NO" (not occurring), "NE" (not estimated), "NA" (not applicable), "IE" (included elsewhere) or "C" (confidential), were used to report emission data. Negative values denote removals; positive values denote emissions.

28. The changes in emissions from 1990 to 2016 were calculated using exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the tables. An en dash (–) signifies a percentage change exceeding 10,000 per cent.

Table 5

Total aggregate anthropogenic emissions of CO_2, CH_4, N_2O and F-gases without emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	420 100	485 325	539 172	527 326	537 551	30.7
Austria	78 690	80 432	84 931	76 442	78 856	1.2
Belarus[a]	139 274	81 217	94 247	94 915	90 171	–34.3
Belgium	146 654	149 784	132 712	114 010	117 584	–19.7
Bulgaria[a, b]	116 753	59 569	60 548	58 582	61 748	–49.4
Canada	603 205	731 599	693 967	716 166	713 817	16.7
Croatia[a]	31 894	25 831	27 986	23 698	24 189	–23.8
Cyprus	5 591	8 271	9 419	8 271	8 328	56.9
Czechia[a]	197 476	149 003	139 572	126 567	127 621	–34.4
Denmark	70 599	71 388	64 492	52 129	49 618	–26.9
Estonia[a]	40 398	17 305	21 131	21 066	18 049	–51.4
European Union[c]	5 646 080	5 159 788	4 775 474	4 288 987	4 317 925	–24.0
Finland	71 143	70 044	75 462	58 855	55 347	–17.4
France	549 336	554 707	516 805	460 708	464 566	–15.3
Germany	1 251 635	1 044 969	942 783	902 676	906 752	–27.3
Greece	103 101	126 346	118 364	99 088	95 310	–11.1
Hungary[a, b]	109 438	73 395	65 344	57 942	61 010	–43.8
Iceland	3 634	4 067	4 879	4 665	4 749	28.5
Ireland	55 490	68 555	61 233	57 316	59 426	10.9
Italy	518 363	554 464	503 989	425 277	432 878	–17.5
Japan	1 266 694	1 372 245	1 300 302	1 359 669	1 321 061	3.0
Latvia[a]	26 430	10 513	12 374	11 233	11 318	–57.3
Liechtenstein	229	248	230	201	199	–18.0
Lithuania[a]	48 108	19 470	20 709	19 905	20 175	–58.3
Luxembourg	12 786	9 667	12 167	10 766	10 275	–21.6
Malta	2 102	2 811	2 968	2 909	2 225	–9.1
Monaco	100	108	86	80	82	–21.1
Netherlands	220 604	219 056	213 172	186 293	194 552	–11.6
New Zealand	65 815	76 102	78 672	80 877	80 703	19.6
Norway	51 697	54 598	55 136	53 246	53 871	3.0
Poland[a, b]	569 841	389 605	405 973	381 831	385 170	–30.5
Portugal	59 825	83 142	69 943	65 086	69 413	13.0
Romania[a, b]	302 631	140 734	122 182	115 371	116 211	–62.8
Russian Federation[a]	3 734 345	2 249 072	2 573 185	2 619 991	2 629 877	–29.2
Slovakia[a]	73 980	49 571	46 260	40 472	40 906	–44.5
Slovenia[a, b]	20 397	19 075	19 665	16 668	16 860	–13.1
Spain	287 656	385 572	355 882	324 326	335 809	12.9
Sweden	71 515	68 649	64 412	53 866	53 755	–26.0
Switzerland	53 196	52 195	54 137	48 359	47 813	–9.4
Turkey[d]	210 715	293 494	402 564	451 809	469 930	135.4
Ukraine[a]	947 253	420 515	407 263	362 043	319 012	–64.3
United Kingdom	799 915	716 797	615 517	529 160	511 274	–39.2
United States	6 355 634	7 216 645	6 922 946	6 763 141	6 638 133	2.4
Number of Parties showing a decrease in emissions by more than 1 per cent:						*30*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*13*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 6

Total aggregate anthropogenic emissions of CO_2, CH_4, N_2O and F-gases with emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					Change from 1990
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	576 801	546 999	561 902	520 955	517 205	–9.0
Austria	66 708	64 067	79 053	71 716	74 410	13.1
Belarus[a]	118 169	47 974	54 121	64 807	62 761	–41.1
Belgium	144 220	147 894	131 176	112 809	116 402	–19.2
Bulgaria[a, b]	101 519	50 141	51 427	51 983	55 418	–48.3
Canada	535 510	690 468	662 068	683 249	687 430	26.3
Croatia[a]	25 281	18 427	20 975	17 405	18 818	–25.3
Cyprus	5 323	8 333	8 937	7 700	7 761	66.4
Czechia[a]	190 913	140 254	133 570	120 260	121 088	–34.9
Denmark	75 387	74 914	63 693	52 405	53 841	–24.3
Estonia[a]	38 854	13 934	19 145	19 401	15 793	–56.5
European Union[c]	5 386 300	4 844 478	4 448 675	3 969 005	4 000 271	–25.9
Finland	57 124	47 628	47 930	27 991	26 589	–44.5
France	523 489	532 863	479 254	418 298	423 737	–18.1
Germany	1 220 323	1 007 008	926 414	887 785	892 376	–26.7
Greece	100 982	124 410	115 325	98 957	91 618	–12.6
Hungary[a, b]	107 682	72 986	61 331	53 078	55 654	–46.9
Iceland	13 727	14 156	15 162	14 936	14 996	8.5
Ireland	61 889	74 866	66 267	62 580	64 498	7.4
Italy	515 321	538 809	473 349	391 852	397 552	–22.8
Japan	1 204 248	1 284 423	1 230 488	1 294 690	1 260 747	3.6
Latvia[a]	15 733	872	11 017	12 516	12 020	–34.1
Liechtenstein	235	272	249	217	208	–16.5
Lithuania[a]	43 046	10 912	11 727	13 633	14 031	–73.0
Luxembourg	12 834	8 965	12 014	10 309	9 868	–25.7
Malta	2 105	2 814	2 970	2 912	2 228	–9.1
Monaco	100	108	86	80	82	–21.2
Netherlands	226 658	225 122	219 302	192 882	201 209	–11.0
New Zealand	36 275	44 012	47 605	56 004	55 842	54.2
Norway	41 333	30 389	28 701	28 687	30 102	–30.1
Poland[a, b]	553 914	356 696	375 577	351 684	357 941	–33.6
Portugal	60 980	77 463	59 032	55 427	60 947	2.0
Romania[a, b]	283 995	117 875	99 170	89 886	92 860	–68.9
Russian Federation[a]	3 893 153	1 847 582	1 943 666	1 968 026	2 026 829	–48.4
Slovakia[a]	64 434	39 617	39 921	34 215	34 168	–47.0
Slovenia[a, b]	15 862	14 329	14 347	11 749	11 882	–19.8
Spain	248 307	342 602	315 432	282 784	293 802	14.4
Sweden	35 589	30 666	19 771	13 572	8 890	–72.1
Switzerland	52 466	56 954	52 592	47 051	46 406	–11.7
Turkey[d]	181 792	258 754	356 607	393 657	406 261	135.4
Ukraine[a]	889 283	375 125	370 178	341 952	296 942	–63.9
United Kingdom	797 787	708 924	601 077	514 750	496 186	–40.9
United States	5 536 014	6 463 882	6 206 014	6 022 765	5 942 941	4.7
Number of Parties showing a decrease in emissions by more than 1 per cent:						*32*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*11*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 7

Total anthropogenic CO_2 emissions without emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	278 424	350 195	406 753	393 464	402 995	48.5
Austria	62 292	66 262	72 383	64 253	66 704	8.2
Belarus[a]	104 135	55 458	63 862	63 780	58 966	–41.9
Belgium	120 484	126 795	113 582	96 391	100 229	–16.8
Bulgaria[a, b]	89 407	45 214	47 793	45 142	48 133	–49.3
Canada	463 880	572 531	555 460	568 008	565 577	20.3
Croatia[a]	23 442	19 816	21 245	17 851	17 997	–22.3
Cyprus	4 643	7 109	8 018	6 879	6 903	57.4
Czechia[a]	164 227	126 897	117 496	104 060	104 785	–35.1
Denmark	54 894	55 640	50 818	38 961	36 625	–30.0
Estonia[a]	37 069	15 362	19 015	18 904	15 891	–52.8
European Union[c]	4 472 076	4 177 014	3 938 606	3 476 890	3 510 586	–22.0
Finland	56 967	57 042	63 992	47 800	44 346	–15.9
France	400 837	416 961	393 476	339 786	344 390	–13.5
Germany	1 052 998	900 960	833 685	793 636	797 078	–23.9
Greece	83 375	102 982	97 343	78 656	74 962	–14.4
Hungary[a, b]	85 571	58 552	52 121	43 915	46 665	–44.4
Iceland	2 237	2 934	3 621	3 462	3 536	56.0
Ireland	32 878	45 194	41 680	36 682	38 444	21.4
Italy	439 944	470 768	424 873	348 476	355 483	–20.4
Japan	1 155 263	1 262 734	1 211 573	1 264 173	1 223 666	4.2
Latvia[a]	19 806	7 099	8 647	7 239	7 334	–63.3
Liechtenstein	199	217	191	161	159	–25.4
Lithuania[a]	35 787	11 788	13 713	12 875	13 142	–63.2
Luxembourg	11 812	8 673	11 154	9 758	9 260	–23.8
Malta	1 943	2 571	2 590	2 463	1 758	–26.9
Monaco	96	99	75	69	70	–29.9
Netherlands	162 441	171 936	182 180	157 347	165 030	1.9
New Zealand	25 454	32 359	35 011	35 610	35 837	35.4
Norway	35 704	42 216	45 823	43 953	44 664	23.3
Poland[a, b]	470 651	316 828	331 710	307 045	310 526	–31.8
Portugal	45 586	66 060	52 898	47 963	52 205	10.3
Romania[a, b]	209 596	93 538	83 551	77 160	77 788	–64.2
Russian Federation[a]	2 571 211	1 499 616	1 657 561	1 667 111	1 671 895	–35.1
Slovakia[a]	61 996	41 533	38 627	33 565	33 897	–45.2
Slovenia[a, b]	16 650	15 430	16 353	13 513	13 599	–13.5
Spain	231 895	311 926	283 877	255 196	271 727	12.5
Sweden	57 506	54 725	52 927	43 226	43 386	–26.0
Switzerland	44 162	43 612	45 045	39 238	38 739	–11.2
Turkey[d]	146 507	226 030	319 528	357 560	380 858	174.9
Ukraine[a]	705 832	279 538	293 519	256 584	223 580	–66.7
United Kingdom	601 343	566 933	511 979	438 269	422 194	–33.8
United States	5 121 264	6 000 606	5 701 076	5 568 759	5 420 804	3.7
Number of Parties showing a decrease in emissions by more than 1 per cent:						*29*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*14*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 8

Total anthropogenic CO_2 emissions with emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					Change from 1990
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	415 582	394 363	412 174	370 328	368 529	–9.9
Austria	50 142	49 739	66 349	59 372	62 100	25.7
Belarus[a]	83 008	22 188	23 715	33 649	31 443	–53.5
Belgium	118 039	124 854	111 942	95 045	98 892	–16.2
Bulgaria[a, b]	73 950	35 313	38 090	37 932	41 169	–48.5
Canada	394 234	528 847	522 195	533 307	537 011	34.0
Croatia[a]	16 788	12 206	14 131	11 457	12 501	–24.5
Cyprus	4 375	7 161	7 534	6 307	6 336	68.6
Czechia[a]	157 580	118 073	111 394	97 699	98 194	–35.8
Denmark	59 639	59 107	49 942	39 152	40 757	–26.6
Estonia[a]	35 523	11 987	17 011	17 217	13 614	–58.5
European Union[c]	4 191 429	3 839 812	3 591 995	3 137 520	3 173 087	–24.4
Finland	40 138	31 991	34 202	14 745	13 401	–53.5
France	370 770	390 237	351 546	293 174	299 313	–17.5
Germany	1 019 980	861 327	815 640	777 033	780 981	–23.0
Greece	81 187	100 812	94 271	78 500	71 244	–16.2
Hungary[a, b]	83 767	58 046	48 043	38 973	41 232	–48.4
Iceland	9 902	10 620	11 569	11 415	11 468	15.1
Ireland	38 668	50 874	45 804	41 214	42 776	14.2
Italy	434 595	453 502	393 234	314 121	319 310	–26.5
Japan	1 092 512	1 174 631	1 141 504	1 198 919	1 163 094	5.0
Latvia[a]	8 055	–3 603	6 286	7 470	6 977	–34.6
Liechtenstein	204	240	210	176	168	–23.6
Lithuania[a]	30 591	3 093	4 564	6 434	6 828	–85.2
Luxembourg	11 839	7 950	10 984	9 287	8 840	–28.2
Malta	1 946	2 574	2 592	2 466	1 761	–26.9
Monaco	96	99	75	69	70	–29.9
Netherlands	168 488	177 939	188 204	163 812	171 558	2.1
New Zealand	–4 383	–45	3 660	10 514	10 775	–362.4
Norway	24 890	17 515	18 861	18 864	20 365	–23.1
Poland[a, b]	454 509	283 503	300 651	275 776	282 164	–35.8
Portugal	45 863	59 554	41 288	37 900	43 232	–4.0
Romania[a, b]	189 719	68 954	58 696	49 832	52 418	–74.3
Russian Federation[a]	2 698 059	1 062 072	993 006	979 366	1 030 963	–63.0
Slovakia[a]	52 343	31 501	32 239	27 253	27 098	–48.3
Slovenia[a, b]	12 061	10 635	10 994	8 558	8 587	–22.3
Spain	191 864	268 139	243 033	213 327	229 215	14.6
Sweden	19 833	14 961	6 528	1 245	–3 140	–110.3
Switzerland	43 343	48 306	43 438	37 867	37 269	–14.0
Turkey[d]	117 527	191 161	273 417	299 230	317 003	184.6
Ukraine[a]	647 635	233 858	256 205	236 274	201 306	–66.5
United Kingdom	596 948	556 942	495 926	422 338	405 631	–36.0
United States	4 291 016	5 227 009	4 971 649	4 808 752	4 687 452	6.2
Number of Parties showing a decrease in emissions by more than 1 per cent:						*33*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*10*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 9

Total anthropogenic CH_4 emissions without emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	120 087	113 010	103 086	101 649	102 326	–14.4
Austria	10 405	8 434	7 255	6 709	6 632	–36.9
Belarus[a]	18 605	13 393	16 389	16 973	17 369	–8.5
Belgium	12 197	11 008	8 789	8 154	8 107	–34.1
Bulgaria[a, b]	16 838	10 149	7 736	7 390	7 340	–58.1
Canada	88 313	112 364	94 150	101 003	99 424	8.3
Croatia[a]	4 354	3 377	3 973	3 738	3 949	–9.3
Cyprus	653	782	819	806	822	30.4
Czechia[a]	23 613	15 383	14 479	13 925	13 993	–41.7
Denmark	7 668	7 958	7 399	7 011	6 942	–8.0
Estonia[a]	1 910	1 239	1 196	1 098	1 057	–44.6
European Union[c]	719 485	599 896	484 151	452 855	452 700	–37.7
Finland	7 746	6 614	5 373	4 920	4 874	–38.9
France	69 802	69 962	61 900	58 719	57 979	–18.8
Germany	120 227	87 678	58 144	55 806	55 602	–54.7
Greece	10 907	11 630	11 003	10 207	10 045	–11.3
Hungary[a, b]	12 538	8 916	8 018	7 558	7 534	–39.9
Iceland	543	602	636	599	599	9.5
Ireland	14 868	14 387	12 049	12 943	13 323	–7.8
Italy	48 236	50 737	46 769	43 132	43 133	–11.1
Japan	44 338	37 779	34 735	31 879	31 141	–30.6
Latvia[a]	3 539	1 849	1 836	1 956	1 871	–46.2
Liechtenstein	19	17	20	20	19	–0.1
Lithuania[a]	7 028	3 868	3 673	3 438	3 381	–53.3
Luxembourg	631	624	631	614	621	–1.0
Malta	106	174	180	171	178	80.4
Monaco	2	3	3	3	3	37.0
Netherlands	31 958	24 393	19 599	18 236	18 436	–41.8
New Zealand	32 277	35 080	33 815	34 625	34 079	4.4
Norway	5 788	5 673	5 353	5 270	5 163	–12.3
Poland[a, b]	69 721	48 678	47 496	45 987	46 659	–33.9
Portugal	10 392	12 293	11 529	11 145	11 086	6.6
Romania[a, b]	70 187	36 107	30 042	29 742	29 584	–59.3
Russian Federation[a]	922 030	611 795	800 251	832 011	838 809	–7.1
Slovakia[a]	7 192	5 350	4 605	4 229	4 352	–39.0
Slovenia[a, b]	2 583	2 497	2 262	2 043	2 107	–16.9
Spain	34 039	40 142	37 912	35 668	37 160	9.5
Sweden	7 602	7 018	5 441	4 923	4 818	–37.6
Switzerland	6 005	5 287	5 129	4 983	4 956	–18.3
Turkey[d]	42 183	43 484	52 462	58 130	52 393	29.7
Ukraine[a]	189 430	118 570	86 686	70 941	63 280	–64.1
United Kingdom	133 737	109 595	64 939	53 473	51 993	–61.1
United States	779 942	709 234	693 631	663 961	665 381	–15.7
Number of Parties showing a decrease in emissions by more than 1 per cent:						*33*
Number of Parties showing a change in emissions within 1 per cent:						*1*
Number of Parties showing an increase in emissions by more than 1 per cent:						*9*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 10
Total anthropogenic CH_4 emissions with emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	133 189	124 423	113 408	111 605	111 335	–15.4
Austria	10 430	8 458	7 279	6 733	6 656	–36.8
Belarus[a]	18 612	13 402	16 394	16 980	17 425	–8.5
Belgium	12 198	11 008	8 789	8 154	8 107	–34.1
Bulgaria[a, b]	16 839	10 284	7 751	7 392	7 352	–58.1
Canada	89 674	114 162	95 097	102 273	100 993	8.4
Croatia[a]	4 356	3 474	3 975	3 739	3 963	–9.1
Cyprus	653	789	821	806	822	32.2
Czechia[a]	23 658	15 425	14 536	13 955	14 025	–41.6
Denmark	7 684	7 991	7 448	7 066	6 999	–7.4
Estonia[a]	1 910	1 240	1 196	1 098	1 057	–44.6
European Union[c]	726 667	607 455	489 650	457 790	457 799	–37.6
Finland	9 285	7 962	6 351	5 841	5 793	–39.1
France	70 810	71 691	63 140	59 852	59 138	–18.3
Germany	121 102	88 550	59 012	56 671	56 469	–54.4
Greece	10 969	11 838	11 020	10 217	10 055	–11.5
Hungary[a, b]	12 563	8 942	8 027	7 575	7 552	–40.0
Iceland	2 905	2 935	2 896	2 841	2 838	–2.6
Ireland	15 330	14 820	12 602	13 346	13 723	–8.2
Italy	49 719	51 669	47 126	43 475	43 424	–13.0
Japan	44 423	37 858	34 807	31 969	31 214	–30.5
Latvia[a]	4 019	2 324	2 238	2 400	2 322	–41.2
Liechtenstein	19	17	20	20	19	–0.1
Lithuania[a]	7 031	3 872	3 675	3 441	3 383	–53.4
Luxembourg	631	624	631	614	621	–1.0
Malta	106	174	180	171	178	80.4
Monaco	2	3	3	3	3	37.0
Netherlands	31 958	24 393	19 600	18 236	18 436	–41.8
New Zealand	32 395	35 192	33 946	34 731	34 176	4.3
Norway	5 928	5 817	5 501	5 418	5 311	–11.8
Poland[a, b]	69 765	48 711	47 530	46 024	46 695	–33.8
Portugal	10 693	12 627	11 824	11 192	11 227	7.8
Romania[a, b]	70 187	36 111	30 042	29 743	29 585	–59.3
Russian Federation[a]	943 377	632 266	823 152	854 897	861 668	–6.8
Slovakia[a]	7 202	5 375	4 623	4 250	4 375	–38.9
Slovenia[a, b]	2 584	2 497	2 263	2 043	2 107	–16.9
Spain	34 353	40 435	38 000	35 747	37 340	8.9
Sweden	8 071	7 493	5 895	5 392	5 258	–35.8
Switzerland	6 035	5 302	5 142	4 996	4 969	–18.4
Turkey[d]	42 204	43 526	52 467	58 135	52 398	29.7
Ukraine[a]	189 441	118 576	86 717	70 976	63 331	–64.1
United Kingdom	133 753	109 625	64 975	53 505	52 014	–61.1
United States	786 664	721 342	700 569	675 168	687 786	–13.6
Number of Parties showing a decrease in emissions by more than 1 per cent:						*34*
Number of Parties showing a change in emissions within 1 per cent:						*1*
Number of Parties showing an increase in emissions by more than 1 per cent:						*8*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 11
Total anthropogenic N_2O emissions without emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					Change from 1990
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	15 337	19 008	19 490	19 644	19 074	26.6
Austria	4 337	4 349	3 391	3 520	3 527	–16.7
Belarus[a]	16 535	12 366	13 994	14 159	13 834	–15.3
Belgium	10 159	10 260	7 586	6 183	6 022	–43.4
Bulgaria[a, b]	10 505	4 166	4 337	4 925	5 035	–49.5
Canada	39 258	36 061	34 283	35 619	36 378	–5.5
Croatia[a]	2 847	2 479	2 380	1 688	1 818	–40.1
Cyprus	295	351	370	317	326	13.6
Czechia[a]	9 551	6 278	5 457	5 800	5 835	–36.5
Denmark	7 995	6 998	5 246	5 268	5 252	–32.9
Estonia[a]	1 419	622	743	845	876	–41.0
European Union[c]	382 608	302 950	237 749	234 179	233 824	–39.2
Finland	6 377	5 664	4 700	4 660	4 671	–27.4
France	66 857	55 760	42 525	42 173	41 933	–38.5
Germany	65 024	43 087	36 600	38 273	38 809	–41.6
Greece	7 443	6 346	5 489	4 319	4 259	–42.2
Hungary[a, b]	10 952	5 336	3 808	4 232	4 312	–59.0
Iceland	358	337	300	322	303	–16.2
Ireland	7 709	8 019	6 492	6 508	6 518	–13.8
Italy	26 423	28 374	19 057	17 627	17 636	–32.1
Japan	31 739	29 690	22 476	21 302	20 979	–34.9
Latvia[a]	3 085	1 549	1 718	1 823	1 883	–39.4
Liechtenstein	11	10	10	10	10	–11.2
Lithuania[a]	5 292	3 791	3 059	3 134	3 119	–43.5
Luxembourg	342	339	322	319	318	–4.8
Malta	53	58	51	43	42	–20.8
Monaco	2	3	4	4	3	62.3
Netherlands	17 730	15 802	8 248	8 197	8 470	–53.7
New Zealand	7 154	8 329	8 625	9 127	9 151	27.6
Norway	4 211	3 917	2 588	2 560	2 595	–40.2
Poland[a, b]	29 322	22 533	19 708	19 755	18 925	–33.6
Portugal	3 847	4 348	3 369	3 190	3 175	–18.0
Romania[a, b]	18 401	9 334	7 537	7 037	7 143	–62.0
Russian Federation[a]	188 671	100 304	97 294	91 805	92 170	–51.7
Slovakia[a]	4 478	2 555	2 386	1 999	1 899	–56.0
Slovenia[a, b]	921	957	762	751	774	–15.2
Spain	17 455	20 279	16 803	16 641	16 751	–5.9
Sweden	5 730	5 691	4 803	4 680	4 566	–19.6
Switzerland	2 775	2 469	2 426	2 329	2 285	–17.1
Turkey[d]	21 399	22 596	25 890	29 298	29 770	49.4
Ukraine[a]	51 755	22 275	26 278	33 653	31 357	–33.2
United Kingdom	47 513	27 970	21 098	20 571	20 225	–57.7
United States	354 754	358 505	366 756	361 152	379 575	4.2
Number of Parties showing a decrease in emissions by more than 1 per cent:						*37*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*6*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 12
Total anthropogenic N_2O emissions with emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	21 778	25 100	26 477	26 454	24 186	11.5
Austria	4 480	4 484	3 524	3 652	3 661	–16.3
Belarus[a]	16 549	12 384	14 010	14 175	13 891	–15.3
Belgium	10 170	10 311	7 690	6 328	6 177	–41.9
Bulgaria[a, b]	10 726	4 504	4 904	5 535	5 656	–44.8
Canada	39 847	36 816	34 702	36 134	36 987	–5.4
Croatia[a]	2 886	2 588	2 482	1 789	1 929	–37.1
Cyprus	295	353	370	317	326	15.0
Czechia[a]	9 591	6 312	5 501	5 826	5 862	–36.5
Denmark	8 022	7 025	5 273	5 298	5 286	–32.7
Estonia[a]	1 421	625	760	865	897	–39.5
European Union[c]	396 293	317 283	252 062	248 633	248 570	–37.5
Finland	7 648	6 950	5 981	5 930	5 939	–22.8
France	70 069	58 911	45 664	45 243	45 022	–36.9
Germany	65 855	43 888	37 409	39 120	39 663	–41.1
Greece	7 450	6 373	5 507	4 335	4 274	–42.1
Hungary[a, b]	10 974	5 406	3 865	4 293	4 370	–58.7
Iceland	424	406	375	399	380	–11.1
Ireland	7 855	8 217	6 849	6 837	6 857	–11.3
Italy	27 246	29 053	19 699	18 213	18 192	–31.3
Japan	31 960	29 892	22 659	21 487	21 164	–34.7
Latvia[a]	3 659	2 136	2 320	2 431	2 491	–32.2
Liechtenstein	11	10	10	10	10	–9.9
Lithuania[a]	5 424	3 925	3 225	3 301	3 287	–41.6
Luxembourg	363	360	339	333	331	–6.9
Malta	53	58	51	43	42	–20.8
Monaco	2	3	4	4	3	61.9
Netherlands	17 735	15 864	8 354	8 320	8 599	–52.9
New Zealand	7 333	8 532	8 778	9 244	9 255	25.7
Norway	4 521	4 264	2 968	2 941	2 978	–35.6
Poland[a, b]	29 492	22 916	20 338	20 839	20 021	–29.8
Portugal	4 424	4 841	3 772	3 548	3 543	–19.2
Romania[a, b]	19 642	11 057	9 379	8 880	9 161	–54.1
Russian Federation[a]	199 283	115 887	109 429	104 698	107 194	–47.6
Slovakia[a]	4 574	2 609	2 416	2 033	1 937	–56.1
Slovenia[a, b]	973	1 006	803	786	808	–16.2
Spain	17 823	20 802	17 110	16 889	17 076	–6.2
Sweden	7 009	6 996	6 107	5 898	5 787	–17.0
Switzerland	2 834	2 519	2 475	2 379	2 334	–17.0
Turkey[d]	21 437	22 685	26 039	29 470	29 951	50.0
Ukraine[a]	51 971	22 558	26 476	33 837	31 511	–33.2
United Kingdom	49 764	30 058	22 676	22 060	21 679	–56.7
United States	358 661	367 231	372 313	369 576	395 331	7.4
Number of Parties showing a decrease in emissions by more than 1 per cent:						*37*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*6*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 13
Total aggregate anthropogenic emissions of F-gases, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	6 252	3 113	9 843	12 568	13 155	117.1
Austria	1 656	1 387	1 901	1 960	1 993	26.2
Belarus[a]			2	2	3	
Belgium	3 813	1 722	2 755	3 282	3 226	–3.1
Bulgaria[a, b]	3	40	682	1 125	1 240	–
Canada	11 755	10 643	10 074	11 535	12 438	12.7
Croatia[a]	1 251	160	388	421	425	–65.9
Cyprus		29	212	269	277	–
Czechia[a]	84	444	2 140	2 781	3 008	3 703.1
Denmark	42	790	1 029	890	799	1 710.0
Estonia[a]		82	177	220	225	
European Union[c]	71 911	79 928	114 968	125 063	120 815	69.0
Finland	53	724	1 397	1 474	1 456	2 638.0
France	11 840	12 024	18 904	20 030	20 264	73.6
Germany	13 386	13 244	14 354	14 961	15 263	14.3
Greece	1 376	5 388	4 528	5 906	6 044	354.7
Hungary[a, b]	377	591	1 397	2 237	2 500	395.6
Iceland	496	194	322	282	310	–42.6
Ireland	35	955	1 012	1 183	1 142	3 496.9
Italy	3 761	4 585	13 291	16 042	16 626	344.5
Japan	35 354	42 042	31 518	42 315	45 274	38.0
Latvia[a]		15	173	215	230	
Liechtenstein		4	10	11	11	–
Lithuania[a]		23	263	458	533	
Luxembourg	1	32	60	76	76	8 459.4
Malta		8	147	231	247	–
Monaco		4	4	4	6	2 565.0
Netherlands	8 476	6 926	3 144	2 513	2 616	–68.1
New Zealand	930	334	1 221	1 515	1 636	56.2
Norway	5 993	2 793	1 372	1 465	1 449	–73.1
Poland[a, b]	147	1 566	7 059	9 045	9 060	6 044.5
Portugal		441	2 148	2 788	2 946	
Romania[a, b]	4 447	1 754	1 052	1 431	1 696	–56.2
Russian Federation[a]	52 433	37 357	18 078	29 064	27 003	–45.9
Slovakia[a]	315	133	642	679	758	117.7
Slovenia[a, b]	243	192	287	361	380	60.9
Spain	4 268	13 225	17 289	16 821	10 172	135.1
Sweden	676	1 216	1 241	1 037	985	43.9
Switzerland	254	828	1 537	1 810	1 834	604.4
Turkey[d]	625	1 384	4 684	6 821	6 910	950.4
Ukraine[a]	236	132	780	865	795	287.2
United Kingdom	17 323	12 300	17 500	16 848	16 862	–6.7
United States	99 673	148 301	161 483	169 268	172 373	74.0
Number of Parties showing a decrease in emissions by more than 1 per cent:						*8*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*26*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 14

Net anthropogenic CO_2 emissions/removals from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					Change from 1990
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	137 157	44 169	5 422	–23 136	–34 466	–128.4
Austria	–12 150	–16 522	–6 035	–4 882	–4 603	–64.1
Belarus[a]	–21 127	–33 271	–40 148	–30 131	–27 523	3.8
Belgium	–2 445	–1 941	–1 640	–1 346	–1 337	–46.4
Bulgaria[a, b]	–15 457	–9 901	–9 703	–7 211	–6 964	–53.6
Canada	–69 646	–43 683	–33 264	–34 701	–28 565	–56.9
Croatia[a]	–6 654	–7 610	–7 114	–6 394	–5 496	–16.7
Cyprus	–268	52	–484	–571	–567	–125.0
Czechia[a]	–6 647	–8 824	–6 102	–6 361	–6 591	–18.8
Denmark	4 745	3 467	–876	192	4 131	12.1
Estonia[a]	–1 546	–3 375	–2 004	–1 687	–2 277	77.7
European Union[c]	–280 647	–337 202	–346 611	–339 371	–337 499	14.8
Finland	–16 829	–25 050	–29 790	–33 054	–30 945	73.8
France	–30 066	–26 725	–41 931	–46 612	–45 077	36.1
Germany	–33 018	–39 633	–18 045	–16 603	–16 097	–50.9
Greece	–2 188	–2 171	–3 072	–156	–3 718	53.4
Hungary[a, b]	–1 804	–505	–4 078	–4 942	–5 433	140.0
Iceland	7 665	7 686	7 948	7 953	7 931	3.2
Ireland	5 790	5 680	4 125	4 532	4 333	–26.6
Italy	–5 349	–17 266	–31 639	–34 355	–36 173	481.0
Japan	–62 752	–88 103	–70 069	–65 254	–60 572	–9.1
Latvia[a]	–11 751	–10 702	–2 361	231	–357	–83.0
Liechtenstein	5	23	19	15	9	45.0
Lithuania[a]	–5 197	–8 695	–9 149	–6 441	–6 313	66.0
Luxembourg	27	–723	–170	–471	–420	–1 964.2
Malta	3	3	2	3	3	15.1
Monaco						72.7
Netherlands	6 048	6 003	6 025	6 465	6 528	8.2
New Zealand	–29 836	–32 404	–31 351	–25 096	–25 062	–23.0
Norway	–10 814	–24 701	–26 962	–25 089	–24 299	130.2
Poland[a, b]	–16 141	–33 325	–31 059	–31 269	–28 362	81.0
Portugal	278	–6 505	–11 609	–10 063	–8 973	–2 353.9
Romania[a, b]	–19 876	–24 585	–24 855	–27 529	–25 370	32.4
Russian Federation[a]	126 849	–437 544	–664 555	–687 745	–640 932	–628.9
Slovakia[a]	–9 652	–10 033	–6 387	–6 312	–6 799	–28.4
Slovenia[a, b]	–4 589	–4 795	–5 358	–4 955	–5 012	9.5
Spain	–40 031	–43 787	–40 844	–41 869	–42 513	2.9
Sweden	–37 674	–39 764	–46 400	–41 981	–46 525	18.4
Switzerland	–818	4 694	–1 608	–1 371	–1 469	136.7
Turkey[d]	–28 981	–34 869	–46 111	–58 329	–63 855	135.6
Ukraine[a]	–58 197	–45 680	–37 314	–20 310	–22 274	–68.8
United Kingdom	–4 395	–9 991	–16 054	–15 931	–16 562	264.5
United States	–830 249	–773 597	–729 427	–760 007	–733 352	–9.1
Number of Parties showing a decrease in emissions by more than 1 per cent:						*19*
Number of Parties showing a change in emissions within 1 per cent:						*0*
Number of Parties showing an increase in emissions by more than 1 per cent:						*24*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 15

Anthropogenic CH_4 emissions from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					*Change from 1990*
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	13 101	11 413	10 322	9 956	9 009	–24.6
Austria	24	24	24	24	24	–1.7
Belarus[a]	8	9	5	7	56	–41.0
Belgium	0.57	0.002				
Bulgaria[a, b]	1	135	15	2	13	1 274.8
Canada	1 361	1 799	947	1 270	1 569	15.8
Croatia[a]	1	97	2		14	624.7
Cyprus	0.05	7.20	1.13	0.41	0.14	–
Czechia[a]	44	41	57	29	32	–25.6
Denmark	16	33	49	55	57	268.0
Estonia[a]	0.35	1.28	0.11	0.10	0.06	–81.4
European Union[c]	7 181	7 559	5 499	4 935	5 099	–22.4
Finland	1 538	1 347	977	921	919	–40.2
France	1 008	1 729	1 240	1 133	1 159	20.2
Germany	876	871	868	865	867	–1.2
Greece	63	208	16	9	11	–49.5
Hungary[a, b]	25	26	9	17	18	–63.5
Iceland	2 362	2 334	2 260	2 241	2 239	–5.4
Ireland	462	434	553	403	400	–18.9
Italy	1 483	933	357	344	291	–73.3
Japan	86	79	72	90	73	–21.8
Latvia[a]	480	475	402	434	451	–3.9
Liechtenstein						
Lithuania[a]	3	4	1	3	1	–77.1
Luxembourg						
Malta						
Monaco						
Netherlands	0.24	0.28	0.31	0.32	0.33	35.0
New Zealand	118	112	131	106	97	–15.4
Norway	139	145	147	148	148	6.5
Poland[a, b]	44	33	34	38	36	1.5
Portugal	300	334	295	47	141	49.9
Romania[a, b]	0.09	3.33	0.19	1.10	1.10	1 179.2
Russian Federation[a]	21 348	20 471	22 901	22 887	22 859	7.4
Slovakia[a]	10	25	18	21	23	89.1
Slovenia[a, b]	1.20	0.47	0.25	0.07	0.24	1.0
Spain	314	292	88	79	180	–48.5
Sweden	469	475	455	469	439	–6.3
Switzerland	29	15	13	13	13	–45.7
Turkey[d]	20	41	6	5	5	–20.5
Ukraine[a]	11	7	31	34	51	–59.4
United Kingdom	16	30	35	32	21	116.3
United States	6 722	12 108	6 938	11 207	22 404	233.0
Number of Parties showing a decrease in emissions by more than 1 per cent:						*22*
Number of Parties showing a change in emissions within 1 per cent:						*1*
Number of Parties showing an increase in emissions by more than 1 per cent:						*14*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 16
Anthropogenic N_2O emissions from land use, land-use change and forestry, 1990, 2000, 2010, 2015 and 2016

	kt CO_2 eq					Change from 1990
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia	6 441	6 092	6 987	6 810	5 111	–24.2
Austria	144	134	133	132	134	–5.9
Belarus[a]	14	19	16	16	57	13.0
Belgium	11	51	104	145	155	1 364.0
Bulgaria[a, b]	221	338	567	610	621	180.9
Canada	590	754	419	514	609	2.7
Croatia[a]	39	109	102	101	111	179.3
Cyprus	0.02	2.53	0.39	0.14	0.05	–
Czechia[a]	40	34	43	25	27	–31.5
Denmark	27	27	27	30	34	21.5
Estonia[a]	2	3	18	21	21	1 296.0
European Union[c]	13 685	14 333	14 313	14 454	14 746	10.5
Finland	1 271	1 286	1 281	1 270	1 267	0.0
France	3 211	3 151	3 139	3 070	3 089	–2.7
Germany	830	801	809	847	855	3.6
Greece	6	27	17	16	16	162.6
Hungary[a, b]	22	70	56	61	58	133.4
Iceland	66	69	75	77	77	16.5
Ireland	146	198	357	328	339	118.9
Italy	823	679	642	586	556	–8.2
Japan	220	202	183	185	185	–15.8
Latvia[a]	574	587	602	608	608	6.1
Liechtenstein						34.7
Lithuania[a]	132	134	166	166	168	37.2
Luxembourg	21	21	17	14	13	–41.3
Malta						
Monaco	0.01	0.01	0.01	0.01	0.01	–0.2
Netherlands	6	62	106	123	129	2 240.7
New Zealand	179	203	153	117	104	–48.9
Norway	311	347	380	381	382	25.8
Poland[a, b]	170	383	630	1 085	1 097	617.9
Portugal	577	493	404	358	367	–27.4
Romania[a, b]	1 241	1 723	1 843	1 843	2 018	62.6
Russian Federation[a]	10 612	15 584	12 135	12 893	15 024	27.0
Slovakia[a]	97	55	30	34	38	–63.4
Slovenia[a, b]	52	49	41	35	34	–34.9
Spain	368	524	307	248	325	–20.1
Sweden	1 279	1 306	1 304	1 218	1 221	–5.3
Switzerland	59	50	49	50	49	–14.0
Turkey[d]	38	88	149	173	181	416.2
Ukraine[a]	216	283	198	184	153	–39.6
United Kingdom	2 251	2 088	1 578	1 489	1 454	–35.9
United States	3 907	8 726	5 557	8 424	15 757	301.6
Number of Parties showing a decrease in emissions by more than 1 per cent:						*16*
Number of Parties showing a change in emissions within 1 per cent:						*2*
Number of Parties showing an increase in emissions by more than 1 per cent:						*23*

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.

Table 17
Indirect CO_2 emissions, 1990, 2000 2010, 2015 and 2016

	kt CO_2 eq					Change from 1990
Party	*1990*	*2000*	*2010*	*2015*	*2016*	*to 2016 (%)*
Australia						
Austria						
Belarus[a]						
Belgium						
Bulgaria[a, b]						
Canada	806	966	634	590	607	-28.1
Croatia[a]						
Cyprus						
Czechia[a]	2 122	1 158	963	801	799	-63.9
Denmark	1 163	797	459	315	302	-75.3
Estonia[a]						
European Union[c]	4 281	2 658	1 962	1 576	1 563	-65.2
Finland	166	105	70	54	53	-68.2
France						
Germany						
Greece						
Hungary[a, b]						
Iceland						
Ireland						
Italy						
Japan	5 370	4 132	2 356	2 123	2 103	-60.9
Latvia[a]	40	25	16	20	17	-56.2
Liechtenstein						
Lithuania[a]						
Luxembourg						
Malta						
Monaco						
Netherlands	683	353	256	230	227	-68.9
New Zealand						
Norway						
Poland[a, b]						
Portugal	106	221	198	157	165	45.1
Romania[a, b]						
Russian Federation[a]						
Slovakia[a]						
Slovenia[a, b]						
Spain						
Sweden						
Switzerland	403	180	117	112	109	-73.2
Turkey[d]						
Ukraine[a]						
United Kingdom						
United States						

Number of Parties showing a decrease in emissions by more than 1 per cent:	*9*
Number of Parties showing a change in emissions within 1 per cent:	*0*
Number of Parties showing an increase in emissions by more than 1 per cent:	*1*

Note: In accordance with decision 24/CP.19, Annex I Parties may report indirect CO_2 from the atmospheric oxidation of CH_4, carbon monoxide and non-methane volatile organic compounds. Ten Parties voluntarily reported indirect CO_2 emissions in their 2018 inventory submissions.

[a] Party with economy in transition.

[b] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[c] Emission estimates of the European Union are as reported for its 28 member States as a group and are reported separately from those of each individual member State.

[d] Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place it in a situation different from that of other Parties included in Annex I to the Convention.